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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/893,302	06/27/2001	Matthew P. Wenger	328 P 603	1990
7590	12/23/2003		EXAMINER	
ANTHONY G. SITKO MARSHALL, GERSTEIN & BORUN 6300 SEARS TOWER, 233 SOUTH WACKER DRIVE CHICAGO, IL 60606-6357			GRIER, LAURA A	
			ART UNIT	PAPER NUMBER
			2644	9

DATE MAILED: 12/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/893,302	WENGER ET AL.
Examiner	Art Unit	
Laura A Grier	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 6/27/01

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-68 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) 49-55 is/are allowed.

6) Claim(s) 1-6,9-35,38,39,42-48 and 56-68 is/are rejected.

7) Claim(s) 7,8,36,37,40 and 41 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) The translation of the foreign language provisional application has been received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) Notice of References Cited (PTO-892) 4) Interview Summary (PTO-413) Paper No(s). _____ .
2) Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) Notice of Informal Patent Application (PTO-152)
3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 and 8 . 6) Other: _____

DETAILED ACTION

Specification

1. The abstract of the disclosure is objected to because: line 2, recites the term, "disclosed". Correction is required. See MPEP § 608.01(b).
2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: Claim 29, recites the signal processing being, "shotgun".

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 1, 2, 5, 6, 9, 19-21, 23-28, 32, 33-36, 38-39, 42-48, 56-59, and 60-63** are rejected under 35 U.S.C. 102(e) as being anticipated by Deline et al., U. S. Patent No., 6420975.

Regarding **claim 1**, Deline discloses a interior rearview mirror sound processing system. Deline's disclosure comprises a microphone module in which one or more microphones (col. 13, lines 28-30) may utilized, which reads on a microphone array, and a DSP, which reads on a signal processing system (figures 12 and 16, and col. 6, lines 41-64, and abstract).

Regarding **claim 2**, it is inherent the microphone array may be one dimensional as evident by the fact microphones may be directional or polar.

Regarding **claims 5 and 6**, Deline discloses everything claimed as applied above (see claim 1). Deline further discloses the microphone module mounted to a rearview mirror of a vehicle cabin.

Regarding **claim 9**, Deline discloses everything claimed as applied above (see claim 1). Deline further discloses the microphone module mounted to the headliner of the vehicle (col. 12, lines 43-46).

Regarding **claim 18**, Deline discloses everything claimed as applied above (see claim 1). Deline inherently discloses the system being analog as evident by the fact that system process human voices signals (acoustic) input via the microphone module, where the voice signal is subject to A/D conversion (figure 16).

Regarding **claims 19-20, and 28**, Deline discloses everything claimed as applied above (see claim 18 and 27, respectively). Further, Deline inherently discloses the analog system (acoustic as well) performing a delay and sum processing function or a filter and sum processing function, as evident by the fact that system utilizes adaptive beamforming technique (col. 48,

lines 53-63), in which the delay and sum processing function and filter and sum processing functions are essential in beamforming.

Regarding **claim 21**, Deline discloses everything claimed as applied above (see claim 1).

Deline further discloses as digital signal processor (DSP).

Regarding **claims 24-26**, Deline discloses everything claimed as applied above (see claim 21). Further, Deline discloses the system performing adaptive signal processing, adaptive beamforming, and/or adaptive noise reduction, (col. 48, lines 26-63.

Regarding **claim 27**, Deline discloses everything claimed as applied above (see claim 1).

Deline inherently discloses the system being acoustic as evident by the fact that system process human voices signals input via the microphone module.

Regarding **claim 32**, Deline discloses everything claimed as applied above (see claim 1).

Deline discloses the microphones being directional (col. 13, lines 7-10).

Regarding **claims 38, and 39**, Deline discloses everything claimed as applied above (see claim 1). Deline discloses audible command control of various parameters (col.11, lines 8-14).

Regarding **claim 33-36**, Deline discloses everything claimed as applied above (see claim 32). Deline inherently discloses the microphone being adjustable and able to maximize directivity as evident by the fact that the microphone is selectively directed between two voices, distinguishing voices between a driver and another occupant (col. 47, lines 41-53).

Regarding **claim 42**, Deline discloses everything claimed as applied above (see claim 1).

Deline inherently discloses the microphone being selectively directed between two commands as

evident by the fact that it can distinguish voices between a driver and another occupant (col. 47, lines 41-53).

Regarding **claim 43**, Deline discloses everything claimed as applied above (see claim 1). Deline discloses audible command control of various parameters for the vehicle (col.11, lines 8-14).

Regarding **claim 44**, Deline discloses a interior rearview mirror sound processing system. Deline's disclosure comprises a microphone module in which one or more microphones (col. 13, lines 28-30) may utilized, which reads on a microphone array, and a DSP, which reads on a signal processing system (figures 12 and 16, and col. 6, lines 41-64, and abstract) and Deline discloses the system performing adaptive signal processing, adaptive beamforming, and/or adaptive noise reduction, (col. 48, lines 26-63).

Regarding **claims 45-48**, Deline discloses everything claimed as applied above (see claim 44). Deline inherently supports the claimed limitation as evidence by the the beamforming technique is used in an environment where there are multiple sounds surrounding the voice of the speaker and thus defining an acceptance area or locating in the speaker or adjusting the beam of the microphone is inherent.

Regarding **claim 56**, Deline discloses an interior rearview mirror sound processing system. Deline's disclosure comprises a microphone module in which one or more microphones (col. 13, lines 28-30) may utilized, which reads on a microphone array and located on the rearview mirror in a vehicle, and a DSP, which reads on a signal processing system (figures 12 and 16, and col. 6, lines 41-64, and abstract); noise reduction means such as noise cancellation

techniques and adaptive beamforming (col. 48, lines 26-63); and voice-activated or controlled vehicular functions (col. 11, lines 8-14).

Regarding **claims 57-59**, Deline discloses everything claimed as applied above (see claim 56). Deline inherently supports the claimed limitation as evidence by the beamforming technique is used in an environment where there are multiple sounds surrounding the voice of the speaker and thus defining an acceptance area or locating in the speaker or adjusting the beam of the microphone is inherent.

Regarding **claim 60**, Deline discloses a interior rearview mirror sound processing system. Deline's disclosure comprises a microphone module in which one or more microphones (col. 13, lines 28-30) may utilized, which reads on a microphone array and located in the headliner in a vehicle (col. 12, lines 43-46) , and a DSP, which reads on a signal processing system (figures 12 and 16, and col. 6, lines 41-64, and abstract); noise reduction means such as noise cancellation techniques and adaptive beamforming (col. 48, lines 26-63); and voice-activated or controlled vehicular functions (col. 11, lines 8-14).

Regarding **claims 61-63**, Deline discloses everything claimed as applied above (see claim 60). Deline inherently supports the claimed limitation as evidence by the beamforming technique is used in an environment where there are multiple sounds surrounding the voice of the speaker and thus defining an acceptance area or locating in the speaker or adjusting the beam of the microphone is inherent.

6. **Claims 1, 31-31, 64-68** are rejected under 35 U.S.C. 102(e) as being anticipated by Finn et al., U. S. Patent No. 6535609.

Regarding **claims 1, 30-31 and 64**, Finn discloses a cabin communication system. Finns' disclosure comprises a plurality of microphone arrays, and filters and a summing amplifier coupled to provide beamforming of the microphones (figures 1 and 3, col. 4, lines 12-33, col. 5, lines 4-15, and lines 61-67 and col. 6, line 1), which reads on a plurality of microphone arrays with a plurality of speakers (outputs) and a signal processing system.

Regarding **claims 65-68**, Finn discloses everything claimed as applied above (see claim 64). Finn inherently supports the claimed limitation as evidence by the beamforming technique is used in an environment where there are multiple sounds surrounding the voice of the speaker and thus defining an acceptance area or locating in the speaker or adjusting the beam of the microphone is inherent.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 3-4** are rejected under 35 U.S.C. 103(a) as being unpatentable over Deline in view of Matsuo, U. S. Patent No. 6600824.

Regarding **claims 3 and 4**, Deline discloses everything claimed as applied above (see claim 1). However, Deline fails to specifically disclose the microphone array as multi-dimensional. The examiner maintains that multi-dimensional microphone arrays were well known in the art.

Regarding the multi-dimensional microphone array, in a similar field of endeavor, Matsuo discloses a microphone array system. Matsuo's disclosure comprises both a two dimensional and three dimensional array system (col. 12, lines 6-11).

It would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Deline by incorporating multi-dimensional microphone arrays for the purpose of picking up sound at various arbitrary positions in a given listening space.

9. **Claims 10-17, and 22-23** are rejected under 35 U.S.C. 103(a) as being unpatentable over Deline.

Regarding **claims 10-17**, Deline discloses everything claimed as applied above (see claim 1). However, Deline fails to disclose the microphone array being positioned in various locations, therein as claimed. It was well known for microphones to be positioned in different areas within a vehicle. Thus, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to modify the invention of Deline by implementing microphones (arrays) in different locations in a vehicle for the purpose of providing efficient communication in a vehicle are desired and for the purpose of acquiring optimal noise reduction required and/or desired for a vehicle.

Regarding **claims 22-23**, respectively, Deline discloses everything claimed as applied above (see claim 1). However, Deline fails to disclose the signal processor performing Griffiths Jim processing or Frost processing, respectively. The examiner takes official notice that Griffiths Jim and Frost processing were well known in art. Thus, it would have been obvious to one of the ordinary skill in the art the time the invention was made to modify the invention of

Deline by implement the beamforming processing technique of Griffiths or Frost, wherein, the processing techniques are commonly known and used when processing a beam of an array of microphones for the purpose of improving the directivity and improving the signal-to-noise ratio (noise reduction) of the signal.

Allowable Subject Matter

10. Claims 49-55 are allowed.
11. Claims 7-8, 36-37 and 40-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Prior Art Citation

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gersabeck et al., U. S. Patent No. 6529608 discloses a speech recognition system.

Marash et al., U. S. Patent No., 6594367 discloses a super directional beamforming design and implementation.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura A Grier whose telephone number is (703) 306-4819. The examiner can normally be reached on Monday - Friday, 7:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Forester W. Isen can be reached on (703) 305-4386.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks
Washington, D.C. 20231

Or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4700.

LAG 
December 15, 2003


XU MEI
PRIMARY EXAMINER